

December 3, 2002

Mr. Alan Nelson  
Nuclear Energy Institute  
1776 I Street, NW., Suite 400  
Washington, DC 20006-3708

Mr. David Lochbaum  
Union of Concerned Scientists  
1707 H Street, NW., Suite 600  
Washington, DC 20006-3919

SUBJECT: INTERIM STAFF GUIDANCE (ISG)-04: AGING MANAGEMENT OF FIRE  
PROTECTION SYSTEMS FOR LICENSE RENEWAL

Dear Messrs. Nelson and Lochbaum:

By letter dated January 22, 2002, the Nuclear Regulatory Commission (NRC) staff provided the Nuclear Energy Institute (NEI) and the Union of Concerned Scientists the opportunity to comment on proposed guidance to clarify the fire protection systems program described in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," dated July 2001. The staff received NEI's written comments on June 17, 2002. The staff discussed these comments with NEI during a public meeting on July 25, 2002. The staff finalized the Interim Staff Guidance (ISG) to address these comments. The enclosed ISG consists of: (1) staff position (Enclosure 1); (2) aging management programs (Enclosure 2) for Chapter XI.M26, "Fire Protection" and Chapter XI.M27, "Fire Water Systems" of NUREG-1801, GALL Report; and (3) FSAR Supplement Table 3.3-2 (Enclosure 3) of NUREG-1800, "Standard Review Plan for Review of License Renewal." The staff plans to incorporate these comments into the improved license renewal guidance documents in a future update. The staff considers this ISG as clarifications with no additional requirements and, therefore, did not perform a backfit evaluation.

As requested by NEI, the staff has assigned the following ISG designations for previously approved ISGs, to date, in order to assist the applicants with their license renewal applications before a future update. The corresponding ADAMS accession numbers are shown in the parentheses:

- ISG-01 Staff Guidance on the Position of the GALL Report Presenting One Acceptable Way to Manage Aging Effects for License Renewal (ML013300531)
- ISG-02 Staff Guidance on Scoping of Equipment Relied on to Meet the Requirements of the Station Blackout Rule for License Renewal (ML020920464)
- ISG-03 Revision of Chapters II and III of GALL Report on Aging Management of Concrete Elements (ML013300426)

For the above approved ISGs, the staff requests that the NEI consider corresponding changes in NEI 95-10, Revision 3, "Industry Guidance for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," if any. Should you have any questions regarding this matter, please contact Peter Kang at 301-415-2779.

Sincerely,

/RA/

David B. Matthews, Director  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Project No. 690

Enclosures: As stated

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## NRC Staff Position on Aging Management of Fire Protection Systems

### Introduction

The staff plans to revise the Fire Protection (FP) system aging management program in NUREG-1801.

#### 1. Staff Position for Wall Thinning of FP Piping Due to Internal Corrosion

Fire Protection (FP) piping is typically designed for a 50-year life in industrial applications. The limiting aging mechanism is general corrosion. Because the general corrosion of FP piping is typically very uniform, loss of intended function as a result of catastrophic failure caused by wall thinning throughout the system is possible and needs to be managed. However, internal inspections performed during each refueling cycle by disassembling portions of the FP piping, as stated in NUREG-1801, Chapter XI.M27, "Fire Water Systems," may not be most effective means to detect this aging effect. Each time the system is opened, oxygen is introduced into the system and this accelerates the potential for general corrosion. Therefore, the staff recommends that the applicant perform a baseline pipe wall thickness evaluation of the fire protection piping using a non-intrusive means of evaluating wall thickness, such as volumetric inspection, to detect this aging effect before the current license term expires. The staff also recommends that the applicant perform pipe wall thickness evaluations at plant-specific intervals during the period of extended operation. The plant-specific inspection intervals are determined by engineering evaluation performed after each inspection of the fire protection piping to detect degradation prior to the loss of intended function. As an alternative to pipe wall thickness evaluations, an applicant may use the existing Chapter XI.M27.

As part of the review of this issue and the above stated approach, a concern was raised as to the inspection specifications of the internal surface of below grade FP piping. The staff acknowledges that some applicants may be able to demonstrate that the environmental and material conditions that exist on the interior surface of below grade FP piping are similar to the conditions that exist within the interior surface of the above grade FP piping. If an applicant makes such a demonstration, the staff agrees that the results of the interior inspections of the above grade FP piping can be extrapolated to evaluate the interior condition of the below grade FP piping. If not, additional inspection activities are needed to provide the reasonable assurance that the intended function of below grade FP piping will be maintained consistent with an applicant's current licensing basis for the period of extended operation.

#### 2. Staff Position for Testing of Sprinkler Heads

NFPA 25, 1999 Edition, Section 2.3.3.1, "Sprinklers," states, "where sprinklers have been in place for 50 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory for field service testing." NFPA 25 also contains guidance to perform this sampling every 10 years after the initial field service testing.

The 50-year service life of sprinkler heads does not necessarily occur at the 50th year of operation in terms of licensing. The service life is defined from the time the sprinkler system is installed and functional. In most cases, sprinkler systems are in place several years before the operating license is issued. However, sprinkler systems in some plants may have been installed after the plant was placed in operation. The staff recommends, in accordance with NFPA 25, that sprinkler head testing should be performed at year 50 of sprinkler system service life, not at year 50 of plant operation, with subsequent sprinkler head testing every 10 years thereafter.

### 3. Staff Position for Valve Line-up Inspections of Halon/Carbon Dioxide Fire Suppression Systems

NUREG-1801, Chapter XI.M26, "Fire Protection," currently identifies the need to perform a functional test of the halon/carbon dioxide fire suppression systems to determine the suppression agent charge pressure and verify that the extinguishing agent supply valves are open and the system is in automatic mode. Section 54.21 of Title 10 of the *Code of Federal Regulations* (CFR) specifies that an aging management review is to be performed for those structures and components that perform an intended function without moving parts, or without a change in configuration or properties, and that are not subject to replacement based on a qualified life or specified time period. The staff reviewed these items and determined that a valve lineup inspection, charging pressure inspection, and an automatic mode of operation verification are operational activities pertaining to system or component configurations or properties that may change, and are not related to aging management. Therefore, the staff position is to revise NUREG-1801 to eliminate the halon/carbon dioxide system inspections for charging pressure, valve lineups, and automatic mode of operation.

#### Backfit consideration

The staff has determined that this ISG clarifies the staff position on aging management of FP systems and does not affect adequate protection or compliance with 10 CFR Part 54, the License Renewal Rule. Therefore, the staff did not evaluate this ISG for backfit.

## NUCLEAR ENERGY INSTITUTE

Project No. 690

cc:

Mr. Joe Bartell  
U.S. Department of Energy  
NE-42  
Washington, DC 20585

Ms. Christine S. Salembier  
Commissioner  
State Liaison Officer  
Department of Public Service  
112 State St., Drawer 20  
Montpelier, VT 05620-2601

Mr. Stephen T. Hale  
Florida Power & Light Company  
9760 S.W. 344 St.  
Florida City, FL 33035

Mr. William Corbin  
Virginia Electric & Power Company  
Innsbrook Technical Center  
5000 Dominion Blvd.  
Glen Allen, VA 23060

Mr. Frederick W. Polaski  
Manager License Renewal  
Exelon Corporation  
200 Exelon Way  
Kennett Square, PA 19348

George Wrobel  
Manager, License Renewal  
R.E. Ginna Nuclear Power Plant  
1503 Lake Rd.  
Ontario, NY 14519

Ronald B. Clary  
Manager, Plant Life Extension  
V.C. Summer Nuclear Station  
Bradham Blvd.  
P.O. Box 88  
Jenkinsville, SC 29065

Mr. Robert Gill  
Duke Energy Corporation  
Mail Stop EC-12R  
P.O. Box 1006  
Charlotte, NC 28201-1006

Mr. John B. Herman  
Manager - Nuclear Licensing  
Omaha Public Power District  
Fort Calhoun Station FC-2-4 Adm.  
Post Office Box 550  
Fort Calhoun, NE 68023-0550

Mr. Paul Gunter  
Director of the Reactor Watchdog Project  
Nuclear Information & Resource Service  
1424 16<sup>th</sup> St., NW, Suite 404  
Washington, DC 20036

Mr. Hugh Jackson  
Public Citizen's Critical Mass Energy &  
Environment Program  
215 Pennsylvania Ave., SE  
Washington, DC 20003

Mary Olson  
Nuclear Information & Resource Service  
Southeast Office  
P.O. Box 7586  
Asheville, NC 28802

Talmage B. Clements  
Manger - License Renewal  
Nuclear Engineering Services  
CP&L  
410 South Wilmington St.  
Raleigh, NC 27602